# Multi-Dimensional Assessment of Technology Maturity

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# Issue:

**Technology maturity at program initiation is a measure of acquisition program risk and a predictor of program success (1999 GAO report)**

**Measuring technology maturity requires a multi-dimensional perspective**
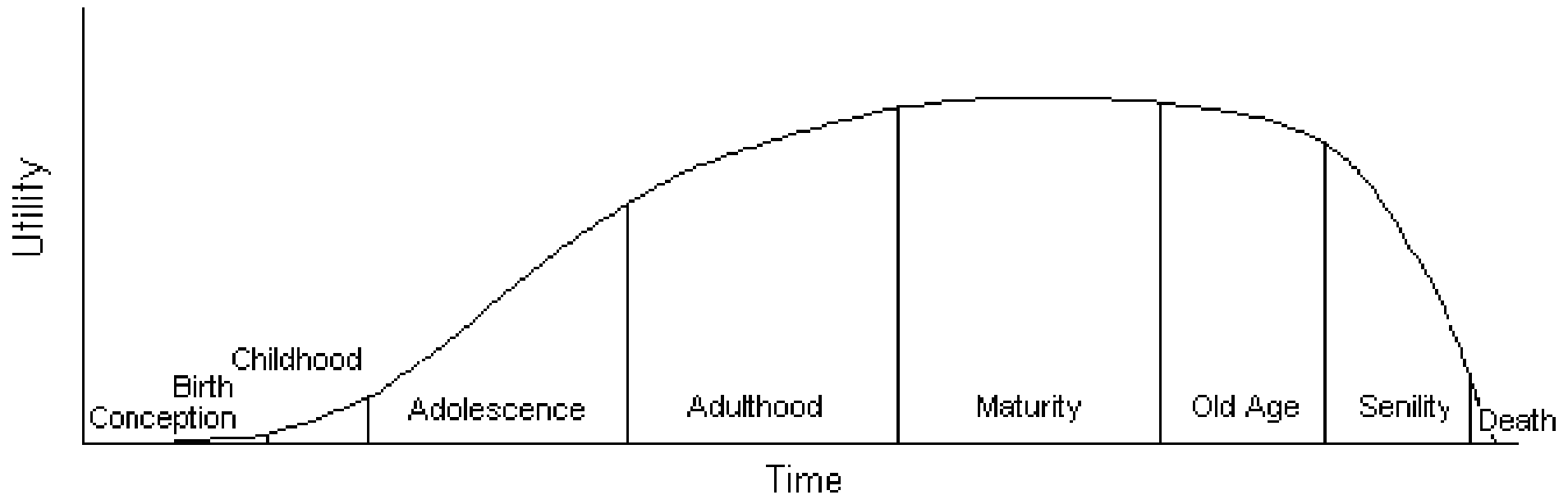
# What Is Technology Maturity?

- **Maturity implies growing or changing over time**
- **In technology maturity:**
  - **The technology itself doesn't change\***
  - **Our understanding of the technology changes**
- **As our understanding improves, the technology's usefulness may (should) improve**
- **Technology maturity measures a technology's position in the technology life cycle**

**\* Gross over-simplification**

# Technology Life Cycle



A technology's usefulness changes over time
- Goal: Increasing Utility as a technology matures
- Later utility decreases as a technology becomes obsolete

The "Whale Chart" shape inspired the conference logo

# Technology Maturity

- **Characteristics**
  - **Neutrality**
  - **Context Dependency**
  - **Dimensionality**

- **Key Problem**
  - **A – Technology Maturity Tells You Where You Are**
  - **B – Technology Maturity Indicates Where You Need to Be**
  - **HOWEVER, Technology Maturity Does NOT Tell You How Much RISK There Is in Going from A to B**

# Neutrality

- **Technology maturity is a "Value Neutral" concept**
- **Maturity is neither good nor bad**
- **Sometimes more maturity is better**
  - **Early in technology development**
  - **Wait until they get the bugs out**
- **Sometimes more maturity is bad**
  - **Approaching obsolescence**
  - **Diminishing manufacturing sources**

# Context

- **The maturity of a technology depends on the context under which it is measured**
- **As the technical context changes, the technology maturity may also change**
  - **Installing an existing technology on a different platform**
  - **Using an existing technology in a new way**
  - **Increasing the scope of an existing technology application**
    - **Software package that is OK for 10 users crashes when 1000s try to access it simultaneously**

# Dimensionality

- **Technology maturity dimensions are different ways of looking at technology maturity**
- **Four different perspectives or viewpoints**
  - **The technology itself**
    - **This perspective has received the most attention to date**
    - **It also gets almost all of the coverage in this conference**
  - **The programmatic view**
  - **The technology developer**
  - **The customer**
- **Each of these can be further broken down**

# Technology Dimensions

- **Current State Of Development (TRL)**
- **Amount Of Development Work Remaining (TRI / TPRM / TPMM)**
- **Difficulty Of Remaining Work (R&D$^3$ / AD$^2$)**
- **Predicted Supportability Of Final Product (Logistics Readiness Levels)**
- **Interoperability With Existing Systems Or Products (CMMi / LISI)**
- **Manufacturing And Producibility (MRL / EMRL)**
- **Human System Interface (HSI) Readiness**

# Programmatic Dimensions

- **Documentation**
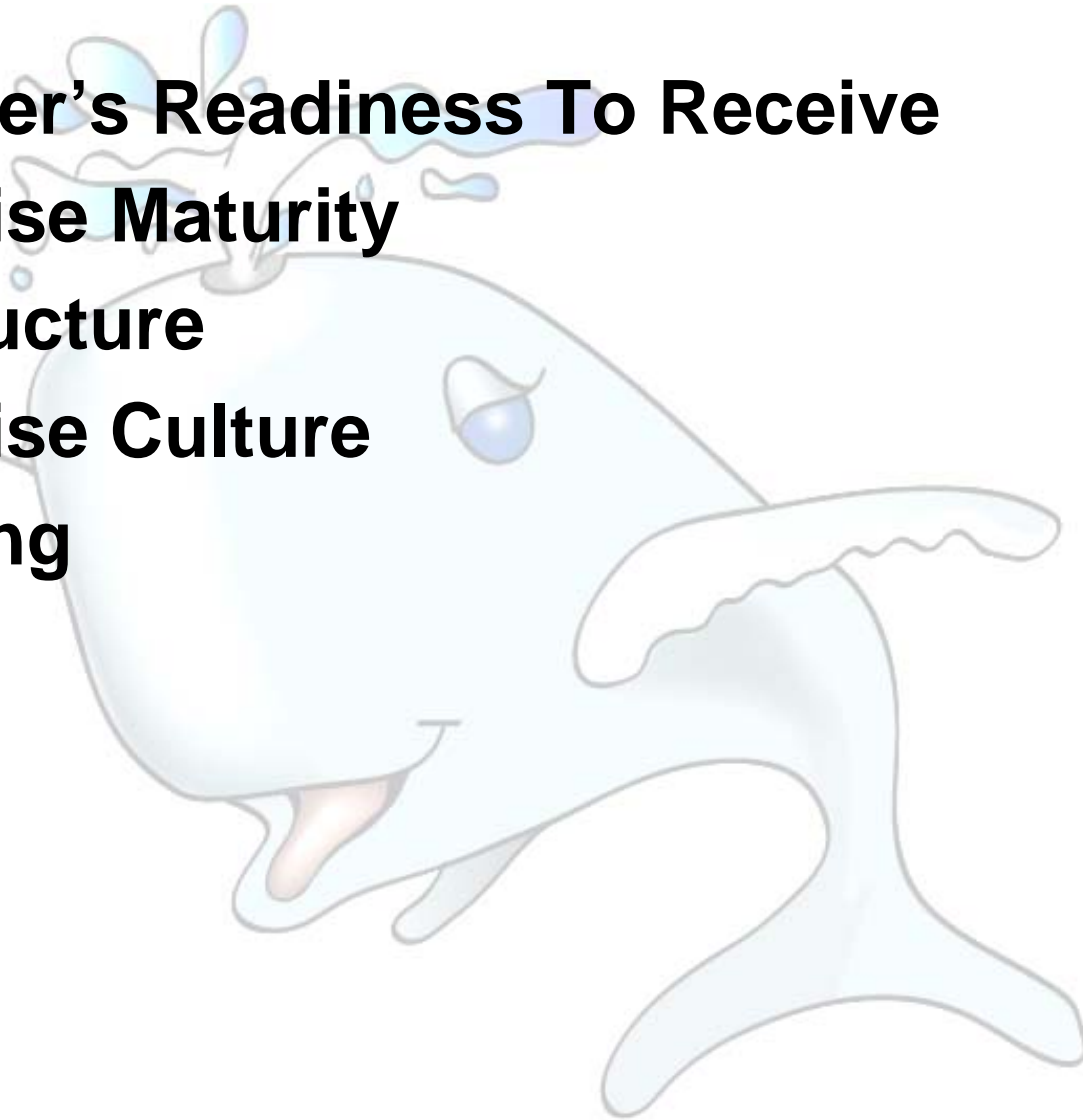- **Customer Focus**
- **Budget**
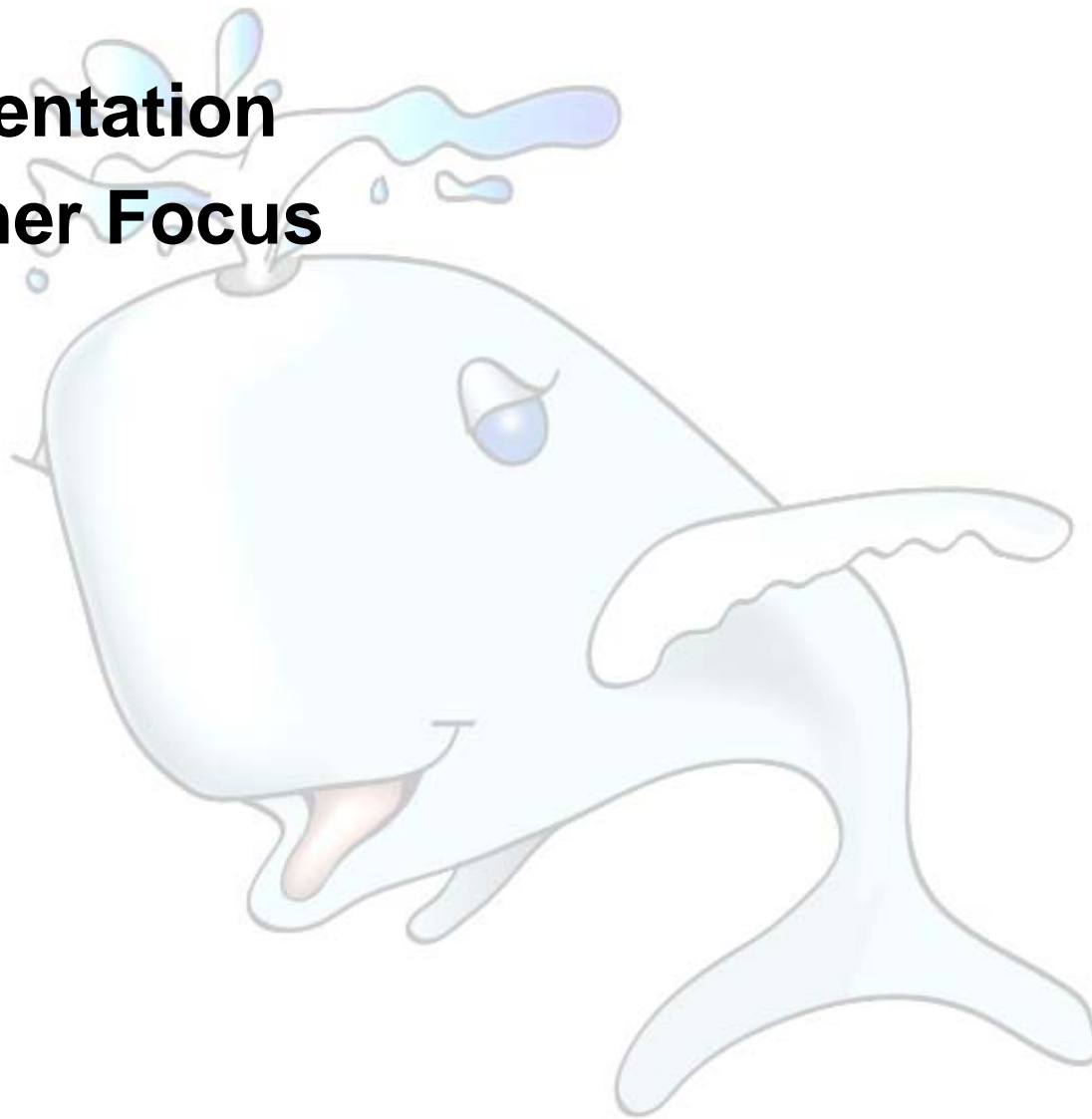
# Developer Dimensions

- **Capability To Perform**
  - **CMM (Capability Maturity Model, software)**
- **Production Process Maturity**
  - **May be included under producibility in technology dimension**
- **Past Performance**

# Customer Dimensions

- **Customer's Readiness To Receive**
- **Enterprise Maturity**
- **Infrastructure**
- **Enterprise Culture**
- **Marketing**

# Conclusion

- **Technology Readiness Assessment Should Support Further Investment Decisions**
  - **Knowledge of Technology Maturity Is Crucial to Technology and System Development**
- **Technology Maturity Measures Where You Are in the Technology Life Cycle**
  - **Technology Maturity Is a Value Neutral Concept**
  - **Technology Maturity Is Context dependent**
  - **Technology Maturity Is Multi-Dimensional**
- **The Technology Maturity Dimensions Discussed Here Are One Way to Approach This Issue**
- **There Is a Lot of Work to Be Done Yet**

# That's All!